EXPLORING THE IMPACT OF GRATIFICATIONS (HEDONIC, UTILITARIAN, SYMBOLIC AND SOCIAL BENEFITS) ON THE BEHAVIORAL INTENTION OF VOICE ASSISTANTS' USERS

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Abstract - Voice Assistants have gained more attention in both real-life and academic fields thanks to their roles in the advanced world. This study aims to investigate the Behavioral Intention of Voice Assistants' users by exploring the mediating role of Subjective Well-being and the moderating role of Innovativeness based on the Utilitarian and Gratification Theory framework. A quantitative study with structural equation modeling was carried out using SPSS and PLS-SEM software to analyze a sample of 230 Voice Assistant users. The findings illustrate that the Subjective Well-being of Voice Assistants' users is influenced by Utilitarian benefits, Symbolic benefits and Social benefits. Behavioral intention is directly influenced by Utilitarian benefits, Hedonic benefits and Social benefits. The research establishes the moderating role of Innovativeness in the relationship of Subjective Well-being and Behavioral Intention. This study provides deeper insight into the motivations of Voice Assistants' users from social and psychological viewpoints.

Key words - Voice Assistants; Utilitarian and Gratification Theory; Subjective Well-being; Behavioral Intention; Innovativeness

1. Introduction

"Hey, Siri." "Hey, Alexa." "OK, Google" The wake words activating Voice Assistants (VAs) have become increasingly familiar amongst individuals and firms since more and more people are using Voice-activated digital assistants. Voice Assistants (VAs) are Artificial Intelligence (AI)-based technology that uses voice recognition, language processing algorithms, and voice synthesis to listen to users' voices and then process information to perform tasks [1]. However, despite the growing popularity of Voice Assistants, the focus has primarily been on in-home [2], [3] and in-car applications [4] in several developed countries. This research delves into the realm of mobile Voice Assistants, specifically exploring their applications and impact in the context of the Vietnamese market. Moreover, extant research is mostly limited to existing theoretical models of general technology adoption such as the Technology Acceptance Model, Unified Theory of Acceptance and Use of Technology and Theory of Planned Behavior; making this emerging technology not reach its full potential. To fill this gap, the study adopts Uses and Gratifications theory, looking beyond traditional adoption models to focus on the social and psychological factors of a new form of human technology interaction.

Given VAs unique characteristic being the core (human-like attributes, hands-free tasks, voice recognition…); VAs deliver highly interactive experiences that have never been seen before in traditional technology. VAs including Apple *Siri*, Google *Google Assistant*, Samsung *Bixby*... have all changed the way individuals consume content, complete tasks, update information, purchase products, interact with firms… Nearly 30% of VAs users already buy and order something through VAs while another 41% are considering using it in the future [5]. In Vietnam, the emergence of VAs is nascent, as some of made-in-Vietnam VAs, such as Zalo *Kiki*, Vingroup *ViVi*, are still in their infancy, leaving many obstacles and opportunities in the Voice-based technology. There is no denying that voice is the future. Vietnam conversational AI market size is forecast to grow at a CAGR of 21.81%, reaching a value of 604.48 million USD by 2029 [6]. As a result, there are a lot of studies in developed nations revealing that VAs are used for both Hedonic and Utilitarian motives [7], looking into how different factors affect people's intention to utilize VAs. However, these studies only point out random motivations and dependent variables instead of employing well-constructed models. Therefore, the study attempts to create multidimensional variables to investigate VAs through the lenses of Uses and Gratifications (U&G) and Technology Readiness while incorporating Subjective Well-being.

Moreover, Subjective well-being is a significant factor driving use of technology [8]. Despite its significant impacts on the acceptance of technology, little attention has been paid to the concept among VA users. For that reason, Subjective Well-being was chosen with U&G to approach the fundamental reasons with VAs. Lastly, the moderating role of Innovativeness in Subjective Well-being and Behavioral Intention has been investigated and witnessed in several contexts, namely VR tourism, but no study has researched its moderating role in the VAs field.

Given the overwhelming growth of human-technology interaction, the existence and capabilities of VAs are far more advanced due to their natural language processing algorithms and in-context replies. However, only a few studies have investigated the fundamental reasons for consumer engagement with VAs. While VAs' adoption is advancing quickly, their usage remains limited to basic tasks. People tend to use VAs to do basic tasks like alarming or making phone calls, make online purchases so it is challenging to analyze valuable input for development.

This study would give valuable information about consumers' motivations to define which dimensions the VAs' developer should focus on to foster VAs adoption. In

contributing to the extant literature, this research uses the U&G model and the complementary variable to gain a clearer understanding of the motivations for using VAs. Therefore, it lays the foundation for the conceptual U&G model on the use of VAs and also figures out the moderating role of Innovativeness, which can be helpful for business aspects and give developers direction for product development. Moreover, the role of Subjective well-being on Behavioral Intention of VAs users is also investigated. With fast-changing technical growth, the study is projected to bring this technological innovation, VAs, closer to daily life with more useful capabilities, thereby increasing human life fulfillment.

2. Literature review

2.1. The concept of Voice Assistant

A Voice Assistant is a virtual assistant using voice recognition, natural language processing, and voice synthesis to understand and respond to spoken commands [9]. Voice Assistants including Google's *Google Assistant*, Apple's *Siri* and Samsung's *Bixby* have all contributed to the alterations in which individuals search for and acquire information, complete tasks, purchase goods, and interact with others. In the consumer technology space, VAs have grown at the highest rate next to smartphone growth. Given this unprecedented development, this technology is supposed to revolutionize the way individuals interact with different technology providers.

2.2. Uses and Gratification Theory:

Uses and Gratification Theory (U&GT) is a theoretical motivational paradigm to explain seeking out specific media and technology to fulfill expectations and needs to obtain gratification [10]. U&GT focuses on social and psychological factors and can be used to explain all kinds of media. Accordingly, it has been applied in many aspects of technology, including Social networking site [11]; Virtual goods [12]. U&GT can also be applied to understand factors influencing people's adoption of VAs, which is often used to satisfy a range of personal needs among humans.

U&GT can be categorized into three dimensions, including Utilitarian benefits, Hedonic benefits, and Symbolic benefits [13]. However, previous studies of online games [14] or social media [15] have demonstrated the critical role of Social Benefits in influencing the adoption of these applications as a main component for U&GT. As a result, from all aforementioned studies, we suppose that U&GT contains four key dimensions, Utilitarian Benefits, Hedonic Benefits, Symbolic Benefits and Social Benefits, which contribute to the motivations of people towards utilizing Voice Assistants for their own gratifications.

Firstly, Utilitarian benefits reflect the task-specific, efficient, and economical aspects of a product/service. Secondly, from a Hedonic benefits perspective, individuals may use a Voice Assistant to derive enjoyment from the interactive experience, which can provide entertainment, companionship, and mental stimulation. Thirdly, from a Symbolic benefits perspective, specific media help individuals reaffirm their social status, and technological advancements [16]. Finally, the Social benefits demonstrate the individual's need to use media and technology for their social needs and interactions [15].

2.3. Subjective Well-being

Subjective Well-being can be defined as "experiencing happiness, including life satisfaction and positive affect" [17]; a person with Subjective Well-being is "blessed with a positive temperament, tends to look on the bright side of things, and does not ruminate excessively about bad events, has social confidants, and possesses adequate resources for making progress toward valued goals". In human-technology interactions, technologies facilitate Subjective Well-being by enabling individuals to arrange their daily activities to be meaningful and enjoyable. Individuals who obtain low levels of Subjective Well-being can utilize technology to enhance their own. The study supposes that Subjective Well-being is a critical factor in VAs context.

2.4. The moderating role of Innovativeness

Innovativeness is defined as a tendency to be the first to use new technologies [18]. In other words, Innovativeness is "the willingness of an individual to try out any new information technology" was given in the context of information technology. Drawing on the research of the mobile electronic medical record, Innovativeness of users is regarded as an important determinant of Perceived Ease of Use and Perceived Usefulness. That is, the Behavioral Intention towards technological innovations is highly related to the ability users deal with innovation [19]. As a result, with unique, innovative features of VAs which are critically different from other traditional technologies, the study considers using Technology enablers as Innovativeness to analyze its moderating role between Subjective Well-being and Behavioral Intention of VAs' Users.

3. Hypothesis development

3.1. Utilitarian Benefits and Subjective Well being

Utilitarian value reflects the task-specific, efficient, and economical aspects of a product/service [20]. Voice Assistants are considered the new landmark of human-technology interaction, drastically changing the way customers consume content, perform tasks. In addition, VAs are the source of information used for seeking knowledge and updating about various topics, namely, news, weather, sports scores, and cooking recipes [21]. Importantly, Utilitarian Benefits of Voice Assistants lie in the way they could immediately serve an individual's personal gratifications, offering hands-free control by voice and the capability to multi-task [22]. As a result, an individual reflects Subjective Well-being even after the first time using VAs as they possess adequate resources and functions to make their own progress toward goals. According to Ellison *et al.* [23] and Yoon [8], the proliferation of social media was due to its ability and convenience when used, offering users self-esteem and life satisfaction. Thus, this study will highlight the role of Utilitarian benefits in enabling the Subjective Well-being of VAs users:

H1: Utilitarian benefits positively influence the Subjective Well-being of VAs users.

3.2. Hedonic Benefits and Subjective Well being

According to the Hedonic perspective, Subjective Well-being can be achieved by pursuing pleasure and enjoyment, no matter whether physical, cognitive, or emotional. Hedonism refers to positive effects related to getting or having material objects and action opportunities one wishes to possess or experience [24]. From the perspectives of Kim *et al.*, information technologies have been proven to impact the Subjective Well-being of users through affective responses rather than rational ones [25]. Likewise, the work of Jin C. demonstrates that fulfilling the desires of entertainment and fantasy influences Users' Subjective Well-being when using social network games [26]. In a similar vein, individuals with Hedonic benefits may use a Voice Assistant to enjoy the entertainment, companionship, and mental stimulation. The higher the Hedonic benefits, the more engaged and satisfying people are in the entire connection with technology. To be specific, VAs are a new entrant into the field of human-technology interactions, prompting curious users to ask "weird" questions that they would never ask a human. With those random nonsense questions, VAs brighten up users' lives with fun and encourage them to be more positive about life. It reflects the Hedonic benefits that individuals may gain from human-technology interaction leading to the stage of Subjective Well-being, proposing:

H2: Hedonic benefits positively influence the Subjective Well-being of VAs users.

3.3. Symbolic Benefits and Subjective Well being

Symbolic Benefits refer to the extent to which an individual perceives to gain a symbolic reward, such as making a favorable impression on others [27]. In the realm of Voice Assistants, the way VAs users appear innovative and tech-savvy when using Voice Assistants reflects Subjective Well-being as he/she is blessed with social status reaffirmation as well as higher order needs. Despite its critical role in activating greater Well-being, little attention has been paid to the Symbolic Benefits toward Subjective Well-being, especially in this domain. However, given the aforementioned rationales, it is critical to define the function of symbolic benefits in Subjective Well-being for the use of VAs, as hypothesized below:

H3: Symbolic benefits positively influence the Subjective Well-being of VAs users.

3.4. Social Benefits and Subjective Well-being

Drawing on previous works in human-technology interaction, it is undeniable that the Social benefits gained from machines are far more advanced than earlier AI devices [28]. Above all, Voice Assistant is one of the latest entrants to this growing field due to human-like attributes, natural language, social cues (e.g., interactivity) and personalized capabilities [29]. As these devices create friendly conversations and fulfill several traditional human-operated roles (e.g., support system); humans often treat them like friends or buddies, evoking positive emotions, beating users' loneliness and forming close relationships. In the context of smart technologies, prior research confirms the essential role of Social Benefits to the Well-being of users when it could generate greater fulfillment of social connection needs, comfort, and emotional satisfaction [30]. In chatbot-related research of Hsu and Lin, the conversational quality of AI bots is positively correlated with user happiness and satisfaction, and ultimately the Subjective Well-being [31]. In light of the fact that Voice Assistant is such a social entity with its humanness, natural language, and the capability to understand user's preferences; Social benefits of Voice Assistant help to generate a higher level of Well-being. Thus, the following hypothesis was formulated:

H4: Social benefits positively influence the Subjective Well-being of VAs users.

3.5. Utilitarian benefits and Behavioral Intention

Utilitarian or function-related motivations have been found to play key roles in influencing users' media and technology uses [32]. In addition, the early research of Davis *et al.* illustrated that the degree to which a user perceives that utilizing a specific technology would increase his or her job performance will significantly influence technology adoption [33]. Furthermore, previous studies found that Utilitarian benefits can motivate users to play online games [34], social media [35] and smart speakers [36]. Therefore, this research aims to delve into the Utilitarian Benefits in the context of Voice Assistant, as hypothesized:

H5: Utilitarian benefits positively influence the Behavioral Intention of VAs users.

3.6. Hedonic Benefits and Behavioral intention

Hedonic Benefits relate to the individual's emotional experience, including the enjoyment or pleasure derived from using a new technology. Previous research outlined the critical role of Hedonic Benefits as individuals tend to use a technology for hedonistic purposes [14]. Similarly, Venkatesh *et al.* outline that the fun and enjoyment obtained from usage can be seen as crucial to adopting technology [32]. In a similar vein, individuals may have in mind, as a purpose, a plan to adopt VA daily for Hedonic purposes. Given that VA is still a new technology viewed as an enjoyable, novel, or unique experience; users are curious and may ask some nonsensical or humorous questions. The VA also responds to them with jokes. Specifically, in unprecedented times during the COVID-19 pandemic, users have interacted with VAs to soothe their boredom and find fun [37]. Thus, the study puts forth the following hypotheses:

H6: Hedonic benefits positively influence the Behavioral Intention of VAs users

3.7. Symbolic Benefits and Behavioral Intention

Symbolic benefits reflect the individual's personal and social moods and qualities [27]. Human social needs include differentiating oneself from others, adjusting to others, and expressing oneself freely. This value has two dimensions: self-expression and social significance. In fact, self-expression refers to the understanding of the inner aspects of personal characteristics [38]. Today, in our research, it is revealed that some customers utilize Co-Branded Wearable Technologies such VAs to demonstrate

their current lifestyle and influence others [39]. In this situation, social values are influenced by what others say and reflect the individual's social and public appearance. Thus, as long as the consumption of VAs depends on social standing, the difference in social values between persons is an essential and effective factor in the behavioral intention of VAs. However, the conclusion regarding the role of Symbolic benefits on behavioral intention in the VAs setting is yet unknown. Hence, this paper submits the following hypothesis:

H7: Symbolic benefits positively influence the behavioral intentions of VAs users.

3.8. Social benefits and Behavioral Intention

Previous research outlines that people interact with technology for social purposes to satisfy their demands. Regarding computer-human interaction, people can feel the "sense of being with another" thanks to artificial intelligence [40]. In addition, previous studies show that there is a positive relationship between social attributes and users' satisfaction [41]. In the virtual world, Social Benefits also enhance the intention to use [42]. Therefore, it is hypothesized that:

H8: Social benefits positively influence the Behavioral Intention of VAs users.

3.9. Subjective Well-being and Behavioral intention

Subjective Well-being is a multidimensional concept that includes people's emotional responses and happiness, life satisfaction and higher order needs. Previous research has outlined the positive relationship between Subjective Well-being and Behavioral intention when adopting technology [43]. This view is also shared by Kim *et al.*, who says that while using information and communication technology (i.e. social networks), people can find happiness and satisfaction, and ultimately Subjective Well-being [25]. Customer loyalty, defined through the continuance intention and positive word of mouth (WoM) of information and communication technologies, is also influenced by consumers' Subjective Well-being [43]. Hence, the study anticipates that Subjective Well-being positively influences the VAs users' Behavioral Intention, putting forth the following hypotheses:

H9: Subjective well-being positively influences VAs users' Behavioral Intention.

3.10. The moderating role of Innovativeness

Parasuraman defined Innovativeness as an individual's inclination to be "an early adopter of technology" [18]. As the capability of Voice Assistants is far-more advanced than earlier human-computer interaction devices, innovators often feel a lot more curious, being among the first to verify whether using VAs could fulfill their personal gratifications. As if the first time experience of early adopters could satisfy their demands towards technological innovations, thereby enhancing Subjective Well-being; innovators are more likely to adopt this new technology in their everyday lives or even express a sense of self-expression. Technology Readiness has been conceptualized as having a moderating effect among perceived quality, satisfaction with technology-enabled services, and behavioral intention in the context of airlines [44]. In addition, Technology Readiness is viewed as a significant factor driving use of the Internet and Internet-based activities [45]. In a similar vein, it is critical to define the moderating role of Innovativeness in association between Subjective Well-being and Behavioral Intention for the use of VAs, as hypothesized below:

H10: Users' Innovativeness positively moderates the relationship between Subjective well-being and Behavioral intention.

4. Research methodology

4.1. Research methods

The study conducted quantitative research methods to validate and test research scales, the research model and research hypotheses. According to Saunders *et al.*, quantitative research frequently connects with experiments involving intensive samples and a larger data base than qualitative methods [46]. Therefore, the Quantitative method and the design of Questionnaires allow primary data to be collected from a large number of respondents, offering insight that decision makers use to accurately forecast the association between research ideas. Taking that advantage, generalized understanding could be captured given that the realm of Voice Assistants is a new landmark in Vietnam. Moreover, the quantitative method examines relationships between variables which align with the paper' objectives of building, testing and developing a fully integrated model corporating the Uses and Gratification theory, Well-being, thus contributing to the unexplored integrated framework in the realm of Voice Assistants.

4.2. Sampling techniques

Non-probability sampling has been chosen. A non-probability sample is one in which several individuals have a greater chance of being picked for the study [47]. For more information, the sampling technique used is the convenience sampling, going along with the purposeful method in the initial stage of pre-test and official survey.

4.3. Data collection

A self-administered online questionnaire was conducted to collect data in Microsoft Form. The sample is made up of users who have used Voice Assistants at least once. After finalizing the questionnaires, we recruited respondents through social media and an offline paper survey, in exchange for small non-profit incentives.

In the survey, first of all, we use multiple ways to approach our target audience who have experienced Voice Assistants at least once in Vietnam. To ensure the responses quality and select the right target audience as mentioned, we have two filter questions in our questionnaire. The first one filters the usage of participants in Voice Assistants and deletes any respondents who have not yet experienced VAs before. Thus, it is a lot easier to select the right respondents in our questionnaire. The second question is a check attention asking, "Please select "Paper" for the question: "How do you feel?". If the participants do not choose the required answer, they will be out of the survey.

4.4. Measurements

All measures in the study were adapted from previous studies and modified to fit the VAs context (see Appendix 1 for detailed measurement items).

The questionnaires were first developed in English. Afterwards, these items were translated into Vietnamese to fit our research context. Then, the questionnaire was translated back into English, adopting the back-translation procedure suggested by Brislin [48]. Two foreign language teachers with TEFL certification also join hands to double-check the accuracy of the translation.

Moreover, a face-to-face pretest was performed by five users including experts knowledgeable about this area and VAs users who have experienced Voice Assistants before. We asked them to give feedback and notify whether or not the questionnaire items contain unintelligible and ambiguous phrases.

The measures of each concept were rated by a 5-point Likert scale, encompassing: 1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree and 5 – Totally agree.

4.5. Grouping Check

When clustering cases based on comparable traits and the sample size exceeds 200, the K-means cluster approach is appropriate (10). To test hypothesis H10, individuals (n = 230) are separated into two groups: low and high innovativeness. When the sample is grouped based on Innovativeness, 122 cases (mean = 3.934) are categorized into a high innovativeness group with a rate all above 3 out of 5, and the remaining cases are considered to be a low innovativeness group with 108 cases (mean = 2.882).

5. Results and Discussion

5.1. Sample Profile

Data were gathered from 230 VAs users in Vietnam who have already experienced VAs. In terms of representativeness, 45.7% of respondents were from 18 to 29 years old, 33.5% of 30 to 39 years old, 18.7% of under 18 years old, and the rest of over 40 years old, which is a very active and innovative demographic segment in the use of Vas (see Appendix 2)

5.2. Measurement Validity and Construct Reliability

Based on our findings, the measuring methodology was fully satisfactory. First, all standardized indicator loadings in the measurement model constructs are above the cutoff value of 0.7, demonstrating indication reliability [49]. Additionally, as shown in Table 1, Cronbach's Alpha coefficient was calculated to assess the reliability of the scales used in the study. Each scale exceeded the value of 0.7, affirming that the scales are reliable indicators of their corresponding variables [49]. Convergent validity and reliability were assessed using composite reliability (CR), Cronbach's alpha, and average variance extracted (AVE). Hair *et al.* define desirable CR and Cronbach's alpha values as those greater than 0.70 as mentioned and AVE scores greater than 0.50. Our results show that all figures are appropriate [50].

Table 1. *Construct reliability and validity*

	Cronbach's alpha	Composite reliability (rho…a)	Composite reliability (rho…c)	Average variance extracted (AVE)
BI	0.735	0.737	0.850	0.655
Hed	0.730	0.730	0.881	0.788
Soci	0.808	0.814	0.874	0.635
SWB	0.752	0.755	0.858	0.668
Sym	0.866	0.870	0.909	0.714
Uti	0.779	0.782	0.858	0.602

Table 2 illustrates a study of discriminant validity between constructs using the Fornell-Larcker criterion [51]. The discriminant validity was tested to determine whether a construct measures what should be measured by checking the square root of the AVE. Each construct exceeds the correlation of each other, thus confirming that the instrument met the criteria for the validity of the constructs. The study also used a comparative table of cross-loading items to test discriminant validity to see the AVE. The results reveal that all constructs have discriminant validity, implying that they measure different characteristics.

Table 2. *Discriminant validity - Fornell Larcker criterion*

	Hed	BI	Soci	SWB	Sym	Uti
Hed	0.887					
BI	0.576	0.809				
Soci	0.334	0.524	0.797			
SWB	0.411	0.658	0.548	0.817		
Sym	0.242	0.362	0.552	0.586	0.845	
Uti	0.453	0.662	0.496	0.715	0.422	0.776

5.3. Exploratory factor analysis

EFA was conducted using the statistical package for social sciences software (SPSS 22.0) to assess the strength and association of each common factor to the related measure. EFA is an exploratory technique for uncovering underlying factor structures, which helped purify and verify the 29 items in this study [52].

Prior to the extraction of the factors, several tests are used to assess the data suitability for factor analysis, including Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and the Bartlett's test of sphericity to confirm that the correlation matrices [53]. To be specific, the KMO index is recommended when the cases to variable ratio are less than 1:5. The KMO index ranges from 0 to 1, with 0.50 considered suitable for factor analysis. Additionally, the Barlett sphericity test yielded a significant result of $p < 0.05$. This indicates that the factor analysis had high sampling adequacy [54].

According to Hair *et al.*, the researcher can establish the factor loading regarded as significant depending on the various sample sizes in order to examine it at stricter levels [54]. As a consequence, given the 230 total responses for each questionnaire in our study, we chose a factor loading of 0.35 to ensure sufficient item retention. Other researchers also made use of the participant-to-variable ratio to decide the appropriate factor loadings for their studies [55], [54].

After two rounds of item removal (eliminating one item per round), the adjusted EFA results were obtained. The modified KMO value was 0.874, and the Barlett sphericity test yielded p = 0.000. The remaining 15 components constituted four constructs, which explained 66.724% of the variation. All items remained the same as those in the hypotheses framework's original scale, including two items SYM03 and SOCI02, which performed on stronger sides.

5.4. Structural Model

The endogenous latent variables' path relationships and R2 values were examined, The R2 for Subjective Well-being is 62.3%, for Behavioral Intention it is 60.4%. The model explains more than 62% of Subjective Well-being and more than 60% of Behavioral Intention. According to Chin (1998), the R2 values are significant [56].

In justification of the hypothesis, the study examines the Path Coefficient or significance to determine the effect of independent variables on dependent variables by looking at the P value (probability value). P value is the significance level of the t-test, compared with comparison thresholds as 0.05. Additionally, the **β** index is examined, comparing the magnitude of the effects of independent variables on the dependent variables.

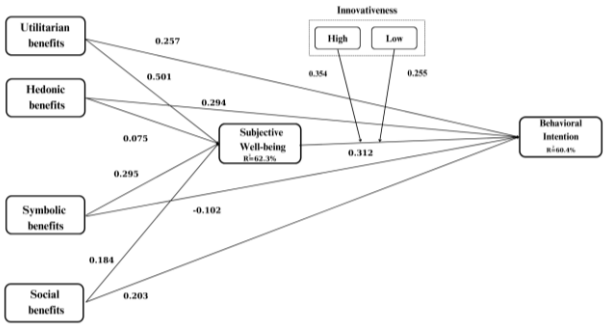

Figure 1. *The results of the PLS-SEM analysis*

The role of Hedonic Benefits – On the one hand, the results show no effect of Hedonic benefits on Subjective Well-being. Hence, H2 (**β** = 0.075, **p** = 0.124) is rejected. On the other hand, the study found the direct relationship between Hedonic Benefits and Behavioral Intention, based on H6 (**β** = 0.294, **p** = 0.000). Therefore, H6 is accepted.

The role of Social Benefits – The results support Social benefits to Subjective Well-being (**β** = 0.184, **p** = 0.000), so H4 is affirmed. In a similar vein with Hedonic Benefits, H8 is supported with the direct effect of Social Benefits to Behavioral Intention (**β** =0.203, **p** = 0.000).

The role of Utilitarian Benefits – The results indicate the importance of Utilitarian benefits to Subjective Well-being (**β** = 0.501, **p** = 0.000), supporting H1. In addition, the effect of Utilitarian benefits and Behavioral Intention of VA users is significant (**β** = 0.257, **p** = 0.000). Therefore, H3 is accepted.

The role of Symbolic Benefits – Symbolic benefits exhibit a positive impact on Subjective Well-being of VA users (**β** = 0.295, **p** = 0.000), confirming H3. However, there is no relationship between Symbolic benefits and Behavioral Intention of VAs users (**β** = -0.102, **p** = 0.077). Therefore, H7 is rejected.

The mediating role of Subjective Well-being – Subjective Well-being has a positive influence on Behavioral Intention, based on H9 (**β** = 0.312, **p** = 0.000).

5.5. The moderating role of Innovativeness

H10 was tested to see if Innovativeness acted as a moderator in the relationship between Subjective Well-being and Behavioral Intention. A multi-group analysis was conducted using PLS-SEM to compare the associations between Subjective Well-being and Behavioral Intention among respondents with high and low innovativeness. Table 3 shows that variations exist across groups with high/low innovativeness but are not overly significant. As a result, H10 is supported.

Table 4. *The summary of results*

	Research hypothesis	Result
H1	Utilitarian benefits positively influence the Subjective Well-being of VAs users	Accepted
H2	Hedonic benefits positively influence the Subjective Well-being of VAs users.	Rejected
H3	Symbolic benefits positively influence the Subjective Well-being of VAs users.	Accepted
H4	Social benefits positively influence the Subjective Well-being of VAs users	Accepted
H5	Utilitarian benefits positively influence the Behavioral Intention of VAs users	Accepted
H6	Hedonic benefits positively influence the Behavioral Intention of VAs users	Accepted
H7	Symbolic benefits positively influence the behavioral intentions of VAs users.	Rejected
H8	Social benefits positively influence the Behavioral Intention of VAs users	Accepted
H9	Subjective well-being positively influences VAs users' Behavioral Intention	Accepted

Table 3. *The results of moderating role of innovativeness*

H10	Path	High (A)	Low (B)	A-B	p-values	Hypothesis test
Inno	SWB → BI	0.354	0.255	0.099	<0.015	Supported

5.6. Discussions

The direct relationship between Hedonic benefits and Behavioral Intention - The results above show that there is a direct association between Hedonic benefits and Behavioral Intention. This is remarkably plausible, thus according to Martin *et al.* [57] and Venkatesh *et al.* [32], Hedonic benefits from technology are critical to success. This is because consumers favor Voice Assistants' ability to produce joyful experiences as it helps them to satisfy their Hedonic motives. Therefore, the higher the Hedonic benefits, the more likely consumers are to use their VAs.

The direct relationship between Hedonic benefits and Subjective well-being - Our result outlined an insignificant relationship between the two mentioned variables. This result is reasonable in the context of Vietnam - a country is characterized as a restrained society in which people do not focus too much on leisure activity. Therefore, it could be a reason why hedonic benefits of VAs have no effects on subjective well-being. Beside that,

the feelings of indulgence such as enjoyment are also considered as the wrong thing in a restrained society, which may hinder the hedonic benefits to create subjective well-being.

The direct relationship between Utilitarian benefits and Behavioral Intention - The study's findings are consistent with earlier ones of Buteau and Lee [58] and Coskun-Setirek and Mardikyan [59], which supported the positive association between the two variables. To explain, when participants believe Voice Assistants facilitate the work performance and tasks completion, they obtain more favorable views toward using them, encouraging their behavior. Additionally, instant access to information, which is enabled by VAs, is a key factor to meet "technology's utilitarian purpose".

The direct relationship between Utilitarian benefits and Subjective well-being - The positive relationship between two variables was in harmony with the research of Mohamed *et al.* and Kim *et al.* [60, 61]. Individuals obtaining Utilitarian benefits while using VAs may also be exposed to the emergence of joy and life satisfaction. This can be because VAs alleviate the mental strain associated with everyday tasks by automating them or providing reminders. Successful interactions with VAs, like completing tasks or receiving information, can trigger positive emotions like joy and contribute to a reduction in negative ones such as frustration or anger, thereby fostering the overall Subjective well-being.

The direct relationship between Social benefits and Behavioral Intention - The findings illustrate that individuals show their eagerness and curiosity to talk to Voice Assistant. Due to its human-like attributes, natural language and machine learning, Social Benefits play a prominent role in engaging users to have in mind on purpose and start re-experiencing VAs. The finding corresponds with the work of Han and Yang [62].

The direct relationship between Social benefits and Subjective Well-being - Our results have extended the work of Li [63] and Kim *et al.* [61] who found that voice interactions convey a strong sense of social presence in the mind of individuals. As Human-VA interaction could fulfill intrinsic social needs, it offers individuals momentary satisfaction and fulfillment of emotional bonds. Thus, the degrees of Subjective Well-being could be enhanced, contributing to a greater attachment to Voice Assistants.

The direct relationship between Symbolic benefits and Behavioral Intention - The hypothesis proposing a positive relationship between Symbolic Benefits and Behavioral Intention failed to be fulfilled. The possible explanation for the insignificance could be due to the absence of Subjective Well-being. Promoting Well-being has become a dominant goal each individual pursues and seeks for during the experience. VAs users not only care about the intelligence and functionality but also expect VAs help them to promote their Well-being. As a result, the direct association between Symbolic Benefits and Behavioral Intention could not be fulfilled without the presence of Well-being. This is also the reason why despite not directly driving the Behavioral Intention, Symbolic Benefits were found to positively influence the Behavioral Intention through enhancing Users' Well-being, which would be discussed in the next statement.

The direct relationship between Symbolic benefits and Subjective Well-being - This relationship was supported in this study. Rauschnabel *et al.* were the first to examine Symbolic Benefits in the growing field of technology [13]. These days, embedding technology and being competent at using these devices are viewed as prestigious. It refers to symbolic rewards, thus driving psychological gratifications towards VAs. Ultimately, the feelings of pride, prestige lure users to re-experience and proudly talk about VAs. Furthermore, given the context of the study within Vietnam – a collectivist society, individuals value symbolic benefits and social status, thereby more likely to re-experience and discuss VAs among their social groups.

The direct relationship between Subjective Well-being and Behavioral Intention - This finding regarding the positive relationship between the aforementioned variables is consistent with previous studies of Ellison *et al.* and Yoon [8, 23]. In the context of VAs, as if individuals feel the promotion of wellness, users would formulate a conscious plan to perform some specified behavior towards re-experiencing, discussing and making recommendations. Furthermore, the study proposes another possible rationale for impact differences of four independent factors, namely Hedonic, Utilitarian, Social and Symbolic benefits. Such differentiated effects can be partly attributed to the role of Subjective Well-being between the antecedent constructs (i.e., Hedonic, Utilitarian, Social and Symbolic benefits) and consequence constructs (i.e., Behavioral Intentions).

The moderating role of Innovativeness on the relationship between Subjective Well-being and Behavioral Intention - The findings have extended the work of Venkatesh *et al.* that outlines the role of Personal characteristics on Behavioral Intention towards technology [32]. Voice Assistants is an innovative AI-based conversational assistant based on a language model; therefore, due to the unique, distinctive features of VAs, early adopters are more likely to be attracted, engage in using it and with momentary satisfaction, experience and use them more competently than other users.

6. Implication and Limitations

6.1. Implication

6.1.1. Theoretical Implication

Despite the growing popularity of Voice Assistant and its expected exceptional growth, extant research is mostly limited to existing theoretical models of general technology adoption (i.e. TAM, UTAUT, TPB). In comparison with traditional technologies like computers, laptop, or mobile banking; Voice Assistant is a completely different story. Individuals generally do not use VAs to improve organizational productivity, in contrast, they consider VAs as a personal device to gratify social and psychological needs. As a result, existing theories and

frameworks may not be comprehensive enough to apply in VAs context. To fill this gap, firstly, the study adopts Uses and Gratification theory, gaining a deeper insight into motivations for the use of VAs.

Secondly, the paper adds a noteworthy contribution to the literature by verifying that Utilitarian, Symbolic and Social Benefits impact the Well-being of users. Previous studies have explained the role of these attributes, such as Symbolic benefits [13]; Social benefits [60]. The study also found the critical role of Utilitarian, Hedonic and Social Benefits towards Behavioral Intention. Users find VAs experience immersive because VAs are human-like, can communicate, and have a sense of humor while assisting humans. In part, VAs add value both effectively, hedonistically and socially, providing useful insights in the field of human-technology interaction.

The study points out the effects of gratifications (utilitarian, hedonic, social, symbolic benefits) on subjective – well-being. The results of the positive effects of utilitarian, social benefits on subjective well-being are found, which consolidates the previous study's results highlighting that functional utility as well as social presence of Voice assistant positively enhance user satisfaction [64]. In addition, the positive role of symbolic benefits on subjective well - being is also examined, which contributes to the finding about using products to affirm the status symbol in advanced technology [65]. The study also found there is no relationship between hedonic benefits on subjective well-being, which is contradictory to the result of the previous study when the relationship of playfulness - one of sub constructs of hedonic benefits and Voice assistant users satisfaction is established [66].

The study also discusses the direct role of gratifications (utilitarian, hedonic, social benefits) on behavioral intention of VA users, which is aligned with the previous study [2], except the role of hedonic benefits. It could be caused by the context of the research when this study does not limit the kind of voice assistant, leading to a fact that people who surveyed could use it for any purpose, even for fun through any genres of voice assistant.

The research demonstrates the moderating role of Innovativeness on the association between Subjective Well-being and Behavioral Intention. The findings extended the work of Venkatesh et al. about the role of Personal characteristics towards technology. Lastly, this work draws an academic significance to Subjective Well-being, the core construct in VAs adoption [32].

6.1.2. Practical Implication

The findings of this study are necessary for the R&D departments of companies selling devices that integrate VAs and technology companies that provide the VAs application service who want to develop VAs technology in the Vietnam market, or technology enterprises in general that plan to start their business in the VAs field.

Firstly, this study highlights the important role of Subjective Well-being in fostering Behavioral Intention among users when they have touchpoints with VAs and experience benefits in U&GT. Hence, companies should consider how to enhance Subjective Well-being by enabling individuals to arrange their daily activities to be meaningful and enjoyable, from basic tasks like setting alarms and searching for information to more difficult ones like having casual conversations with VAs and answering "tricky" questions from users.

Secondly, Hedonic and Utilitarian benefits have differences in the way they affect Behavioral Intention. As users spend time with VAs to gain entertainment through casual conversation with the expectation that they will respond in a natural and funny manner, the R&D department can focus on this point to enhance the conversation by creating content in a humorous manner, such as politely (or humorously) nudging, asking VAs nonsensical questions, and responding in the funniest way. Marketers can utilize these Hedonic benefits to create effective marketing strategies that emphasize how consumers have fun while using VAs and encourage User Generated Content (UGC) about VAs and how people use them.

In contrast, Utilitarian advantages require Subjective Well-being to drive Behavioral Intention toward VA adoption. Thus, developers might include more value-added capabilities in Voice Assistants, such as the ability to search for information, provide informed answers, and ensure that VA functions work properly.

Lastly, the moderating impact of Innovativeness exerts a great contribution on Subjective Well-being and Behavioral Intention. It offers insights into potentially successful market segmentation. Marketers could target groups of users based on their personal characteristics (low versus high innovativeness). As demonstrated, identifying the up-to-date and advanced features can attract highly innovative users and engage them in the use of Voice Assistants. By continuously updating new functions and experiences, it allows individuals with high innovativeness to connect with VAs in the long run.

6.2. Limitations

Firstly, the number of samples is limited, which puts more challenges for the results indicating the most precise and general results of the study. There could be disparities between groups of age. These study results should only be applied to this age blanket to avoid the risk of bias toward other targeted participants surveyed. Moreover, Voice Assistants are not popular in some other countries. Therefore, the results should only be used in Vietnam.

Second, the data collection methodology is also one of the research's drawbacks. The future research should consider combining other different methods to get more insight into the topic.

Thirdly, this study is limited to mobile Voice Assistants such as Siri, Bixby, etc. Therefore, further research should examine the reactions of users in explicit situations or analyze results based on the purposes of each group to have a comprehensive view of users.

Finally, our study examines four aspects of the Uses and Gratifications Theory, including Hedonic, Social, Utilitarian and Symbolic benefits. Future works should

examine the factors underlying these benefits, helping to explain more about the adoption and use of Voice Assistants.

7. Conclusion

Given the expected growth of Voice Assistants in the near future, this research investigated the influence of various gratifications on users' intentions to engage with voice assistants in the market of Vietnam. Using Uses and Gratification theory together with Well-being and Technology Readiness, the study proposed a conceptual model with a view to delving deeper into the underlying motivations behind usage intention of users towards this technology. Understanding this interplay of gratifications is crucial for developers and designers who have already utilized and desired to improve or those who are to create and integrate voice assistants for their future products.

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APPENDIX 1: MEASUREMENT SCALES

Hedonic Benefits - Davis *et al.* [67]

1. I find using Voice Assistant to be enjoyable
2. I find the actual process of using Voice Assistant is entertaining

Utilitarian Benefits - Taylor and Todd [68]

1. I think using my Voice Assistant is a convenient way to manage my time
2. I think completing tasks with my Voice Assistant makes my life easier
3. I think completing tasks with the Voice Assistant fits with my schedule
4. I think completing tasks with the Voice Assistant is an efficient use of my time

Symbolic Benefits - Moore and Benbasat [69]

1. I think using Voice Assistant enhances my image amongst my peers
2. I think using Voice Assistant makes me seem more valuable amongst my peers
3. I think using Voice Assistant is a status symbol for me
4. I think using Voice Assistant makes me seem more prestigious than those who do not

Social Benefits - Graeme McLean, Kofi Osei-Frimpong [2]

1. I think when I interact with Voice Assistant I feels like someone is present in the room
2. I think my interactions with Voice Assistant are similar to those with a human
3. During my communication with Voice Assistant, I feel like I am dealing with a real person
4. I communicate with Voice Assistant in a similar way to I communicate with humans
5. I think Voice Assistant could be a friend of mine
6. I have a good time with Voice Assistant
7. I would like to spend more time with Voice Assistant

Subjective Well-being - Diener [17]

1. I believe that using Voice Assistant is part of my ideal life.
2. I believe that my life is excellent when I use Voice Assistant.
3. I am satisfied with my life when I am using Voice assistant.
4. I have gotten the important things I want by using Voice assistant.

Behavioral Intention - Huang *et al.* [70]

1. I want to re-experience Voice assistant in the future.
2. I would recommend Voice assistant to my friends or others.
3. I want to tell other people positive things about Voice assistant.
4. I would like to follow the advice that the voice assistant suggested.

Innovativeness - Walczuch I [71]

1. In general, I am among the first in my circle of friends to acquire new technology when it appears.
2. I can usually figure out new high-tech products and services without help from others.
3. I keep up with the latest technological developments in my areas of interest.
4. I enjoy the challenge of figuring out high-tech gadgets.
5. I have fewer problems than other people in making technology work for me.

APPENDIX 2: DEMOGRAPHIC INFORMATION

Measure	Item	Frequency	Percent (%)
Gender	Male	67	29.1
	Female	163	70.9
Age	Under 18 years old	43	18.7
	18-29 years old	105	45.7
	30-39 years old	77	33.5
	Over 40 years old	5	17.8
Education	Highschool	45	19.6
	Under-graduated	90	39.1
	Post-graduated	95	41.3

APPENDIX 3: OUTER LOADING

	BI	HED	SOCI	SWB	SYM	UTI
HE01		0.887				
HE02		0.888				
INT01	0.850					
INT02	0.754					
INT03	0.820					
SOCI02			0.799			
SOCI03			0.843			
SOCI04			0.813			
SOCI06			0.727			
SUB01				0.808		
SUB02				0.797		
SUB03				0.847		
SYM01					0.806	
SYM02					0.875	
SYM03					0.853	
SYM04					0.844	
UTI01						0.767
UTI02						0.729
UTI03						0.792
UTI04						0.815